

# Letizia Fracchia

## PERSONAL DATA

Place and date of birth: Alessandria, 9<sup>th</sup> October 1975

Place of residence: Pozzolo Formigaro (AL)

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## BIO AND EDUCATION

Letizia Fracchia is Assistant Professor of General Microbiology at the Department of Pharmaceutical Sciences, Università del Piemonte Orientale. In 1994 she obtained her baccalaureate in Languages at Diodata Roero Saluzzo Institute, Alessandria. In 2000 she graduated *cum laude* in Biological Sciences at the Faculty of Mathematical, Physical and Natural Sciences, Università del Piemonte Orientale with a dissertation entitled: *Molecular aspects of the saline stress adaptation in Sinorhizobium meliloti: quaternary ammonium compounds transportation*. In 2001 she obtained the professional qualification (*Esame di Stato*) for the practice of the profession of Biologist. In 2004 she received the title of PhD in Environmental Science at the Department of Science and Advanced Technologies of the above-mentioned University with a thesis entitled: *Microbial community analysis in finished composts and bioaerosols risk assessment in composting plants*.

## UNIVERSITY CAREER

2006-	Assistant Professor, Università del Piemonte Orientale
2005-2006	"Progetto Lagrange" fellow, Università del Piemonte Orientale
2003-2005	Researcher, Università del Piemonte Orientale
2000-2003	PhD student, Università del Piemonte Orientale

## SCIENTIFIC POSITIONS

2015-	Member of the American Society for Microbiology
2004-	Member of the Italian Society for General Microbiology and Microbial Biotechnologies

## MAIN FIELDS OF INTEREST

1. Applied microbiology
2. Microbial biosurfactants
3. Biofilm
4. Anti-adhesive and antimicrobial compounds
5. Bioaerosol

## CURRENT ISSUES OF RESEARCH

### 1. Biosurfactant-based coatings for the inhibition of microbial adhesion on materials for medical use: experimental models, functionalization strategies and potential applications

The study aims at assessing the interactions between microbial biosurfactants and materials for medical use in order to inhibit microbial colonization. The main objective is to provide specific treatments to bind the biosurfactants to the surface of the materials, in order to optimize their anti-adhesive and anti-biofilm effect. Moreover, the micro-structural characterization and functional interaction between the modified surfaces and pathogenic microorganisms are also deepened.

### 2. Isolation and selection of endophytes from olive tree producing active compounds for biotechnology, biomedical and agro-industrial applications.

The main objective of this study is to characterize the endophytic population of healthy and sick olive trees from South of Italy with the aim of isolating microorganisms with potential applications in the biomedical and agronomic fields. In particular, endophytic bacteria, filamentous fungi and yeasts producing antimicrobial substances against plant pathogens and human pathogens, will be selected, with particular attention, in the latter case, to anti-biofilm activity.

### 3. Study of the effects of N-acetylcysteine on biofilm formation and on the production of virulence factors by clinical isolates of *Staphylococcus epidermidis*

The study, still in the initial stages, is aimed at using N-acetylcysteine, a molecule with anti-bacterial and anti-biofilm properties, to reduce biofilm formation of *S. epidermidis* on medical-grade silicone, by means of viable cells quantification and by electron microscopy studies. A further objective is to evaluate the activity of N-acetylcysteine on the production of important virulence factors during the formation of *S. epidermidis* biofilm.

### 4. Research, quantification and identification of pathogenic bacteria in food matrices.

It is a research carried out within the Finalized Research project entitled "*Taking a step forwards the preparedness for Preventing crises: Improving the molecular detection of emerging pathogens in food*", (scientific advisor Professor Arlorio), to which Dr. Fracchia cooperates. Briefly, the objective of the project aims at improving the extraction and purification methods of nucleic acids or protein antigens of important pathogenic bacteria and viruses from complex food matrices.

## CURRENT FUNDED PROJECTS

PROGRAMME	FUNDED PROJECT
Ateneo- Compagnia di San Paolo 2014	BIOSURF project - " <u>Biosurfactant-based coatings for the inhibition of microbial adhesion on materials for medical use: experimental models, functionalization strategies and potential applications</u> "

## TOP FIVE PAPERS

1. Banat IM, Franzetti A, Gandolfi I, Bestetti G, Martinotti MG, Fracchia L, Smyth TJ, Marchant R (2010). Microbial biosurfactants production, applications and future potential. *Applied Microbiology and Biotechnology*, 87, 427-444. IF 3.337
2. Franzetti A., Gandolfi I., Raimondi C., Bestetti G., Banat I.M., Smyth T.J., Papacchini M., Cavallo M., Fracchia L. (2012). Environmental fate, toxicity, characteristics and potential applications of novel bioemulsifiers produced by *Variovorax paradoxus* 7bCT5. *Bioresource Technology*, vol. 108, p. 245-251, ISSN: 0960-8524 IF 4.494
3. Fracchia L, Dohrmann A.B, Martinotti M.G, Tebbe C.C (2006). Bacterial diversity in a finished compost and vermicompost: differences revealed by cultivation-independent analyses of PCR-amplified 16S rRNA genes. *Applied Microbiology and Biotechnology*, vol. 71, p. 942-952. IF 3.337
4. Fracchia L, Pietronave S, Rinaldi M. And Martinotti M.G (2006). Site-related biological hazard and seasonal variations in two wastewater treatment plants. *Water Research*, vol. 40, p. 1985-1994. IF 5.528
5. Gamalero E, Fracchia L, M. Cavaletto, J. Garbaye, P. Frey-Klett, G.C. Varese, G.C. Martinotti M.G (2003). Characterization of functional traits of two fluorescent pseudomonas isolated from basidiomes of ectomycorrhizal fungi. *Soil Biology & Biochemistry*, vol. 35, p. 55-65, ISSN: 0038-0717 IF 3.932

## AWARDS

1. Winner of the special prize "Donna innovazione" in the competition Start Cup Torino Piemonte 2006.
2. Winner of the local prize "Novara" in the competition Start Cup Torino Piemonte 2006.
3. Winner of the "FEMS junior grant" for the attendance at the 1<sup>st</sup> FEMS Congress of European Microbiologists - 2003 Ljubljana, Slovenia.
4. Winner of the "Fondazione Adriano Buzzati-Traverso" grant for the attendance to the 2<sup>nd</sup> FISV Congress, Riva del Garda, TN

## FURTHER INFORMATION

As undergraduate student, Letizia Fracchia won a *Socrates-Erasmus* grant for an internship of ten months in the Laboratory of Plant Biology and Microbiology of Prof. Daniel Le Rudulier, University of Nice, where she learned microbiological, biochemical and molecular biology techniques. She also spent a period of six months as visiting doctoral student in the laboratory of Professor Christoph C. Tebbe at the Agroecology Institute of the Federal Research Centre on Agriculture in Braunschweig, Germany, where she worked on the analysis of bacterial diversity in amendants by cultivation-independent methods.

In the years 2006-2007 she visited the laboratory of Prof. Alejandro Pidello at the Faculty of Veterinary Sciences, National University of Rosario, Argentina within a scientific cooperation between Italy and Argentina funded by the Italian Ministry of Foreign Affairs where she worked for a project entitled "Biosolids as support for the inoculation of plant growth promoting rhizobacteria

in agricultural systems". In 2009, she spent a period of two months as visiting researcher at the Laboratory of Microbial Biotechnology (Prof. Ibrahim Banat), School of Biomedical Sciences, University of Ulster, in Northern Ireland where she worked on a project entitled "Characterization of a bioemulsifier produced by *Variovorax paradoxus* for biomedical and industrial applications".

Dr. Fracchia is involved in a number of international research collaborations with European and extra-European institutes. In particular, she carries on cooperation with the School of Biomedical Sciences, University of Ulster, Northern Ireland, with the Faculty of Veterinary Sciences, National University of Rosario, Argentina, with the Institute of Systems Biology and Ecology, Academy of Sciences of the Czech Republic. She also cooperates with several Italian research institutions such as Dipartimento di Ingegneria Meccanica e Aerospaziale, Politecnico di Torino; Dipartimento di Ingegneria Industriale, Biotech Research Center, Università di Trento; Bruno Kessler Foundation, Trento; Dipartimento di Medicina di Laboratorio, Sezione di microscopia elettronica, Azienda Provinciale per i Servizi Sanitari di Trento; Dipartimento di Scienze Ambientali, Università degli Studi di Milano-Bicocca, Milano; Laboratorio di Microbiologia – Azienda Ospedaliero-Universitaria "Maggiore della Carità" di Novara.

She is also referent for the exchange of Erasmus students and doctoral students with the Faculty of Pharmacy, University of Ghent, Belgium and the Faculty of Pharmacy, University of Porto, Portugal.